

vibration. (7.) "On the ratio of transverse contraction to longitudinal extension," by Heinrich Schneebeli. The author has applied Kundt's mode of measuring the length of stationary waves to the comparative measurement of the rates of the torsional and longitudinal vibrations of steel rods, and hence to the determination of the ratio between the transverse contraction and longitudinal extension produced by stretching forces: the mean results agree closely with those obtained by Kirchhoff and Okatow, as well as by Everett (Phil. Trans. 1867), from experiments on flexure and torsion. (8.) "On the compensation of an optical difference of path," by J. L. Sirks. An investigation of the condition under which the interference tints produced by polarised light passed through a thin plate of crystal can be achromatised by a compensating plate of selenite. (9.) "Rejoinder to Dr. Most," by L. Boltzmann, relates to the second law of thermodynamics. (10.) "A contribution to the doctrine of Molecules and to the theory of Electricity," by C. Lorenz. An attempt to calculate the absolute number of molecules in a milligramme of water, founded upon Weber and Kohlrausch's absolute measurement of the electro-chemical equivalent of water and on the difference of potentials required for its electrolysis. (11.) "A contribution to the theory of Terrestrial Temperature," by O. Frölich. A discussion of Poisson's expression for the internal temperature of the earth at small depths below the surface, as a function of the time and the superficial temperature. (12.) "Remarks on the 'Bohemian Diamond,'" by Prof. V. L. von Zepharovich. The author states that only *one* diamond (not several, as has been implied in some reports) has been found in Bohemia; that this was discovered in a workshop in Dlaschkowitz, where pyropes (garnets containing chromium) are ground and bored with the help of diamonds; and that it is not yet ascertained how it came to be among the pyrope-sand in which it was found. (13.) "A remarkable stroke of Lightning," by Dr. J. G. Fischer. By examining the position of the magnetic poles in various pieces of iron and steel which were magnetised by the passage of the discharge, the author ascertained that the direction in which the negative electricity passed was downwards into the ground. (14.) "On the ratio of the specific heat of air at constant volume to its specific heat under constant pressure," by Dr. Witte. The author concludes, on experimental and theoretical grounds, that this ratio is not constant, but is a function either of the temperature, or of the pressure, or of both. (15.) "On the minimum of prismatic deviation," by A. Kurz. (16.) "An easy mode of preparing a liquid for the production of Plateau's Equilibrium-figures without weight," by Rudolph Böttger.

The *American Naturalist* for December opens with a paper on the Flora of the Prairies, by Mr. J. A. Allen, in which he gives an interesting sketch of some of the peculiarities of the primitive flora of the Upper Mississippi prairie in northern Illinois, and central and western Iowa, not inaptly termed "the Garden of the West." He remarks that the breaking and turning of the soil at once exterminates a number of the previously dominant species, and instead of lingering as troublesome weeds, the more hardy exotics that through man's influence assume an almost cosmopolitan habit, usurp their places, the cereals, the cultivated grasses, and the noxious weeds of the old world, thoroughly crowding out the original occupants of the soil. Dr. W. Stimpson follows with an article on the Distribution of the Marine Shells of Florida; and Mr. A. S. Packard with one on the Borers of certain Shade trees. Spring time on the Yuron, by Mr. W. H. Dall, gives an account of the sudden advent of summer in that territory. Mr. A. S. Collins on the Impregnation of Eggs in trout-breeding will be interesting to pisciculturists in this country, explaining the principle of a new process pursued at the trout ponds in Caledonia, N.Y. The usual space is devoted to reviews and miscellaneous intelligence, and we have some further details of papers read at the Troy meeting of the American Association.

The *Journal of Botany* for January has increased the amount of its contents by a rearrangement of its type, without any corresponding increase in price. We are glad to observe that it is intended to devote the journal more exclusively in future to British botany, thus supplying a want long felt by workers in this department. In the present number there are several articles of interest, including a description (with plate) by Mr. Worthington Smith, of a new species of fungus gathered in Messrs. Veitch's cool fernery at Chelsea; Observations on the genus *Pottia* (of Mosses), by Mr. W. Mitten; a few notes on Mr. H. C. Watson's Compendium of the "Cybele Britannica," by

the Hon. J. L. Warren; and a Monograph of the genus *Xiphion*, belonging to Iridaceae, by Mr. J. G. Baker. There is also a useful epitome of Dr. M'Nab's important paper on the "Transpiration of Aqueous vapour by Leaves," to which we have already referred; and the column of short Notes and Queries will be found interesting and valuable.

## SOCIETIES AND ACADEMIES

### LONDON

Zoological Society, January 3. — Professor Huxley, F.R.S., V.P., in the chair.—Prof. Flower exhibited and made remarks on a mounted skull of the Common Sturgeon (*Acipenser sturio*), from the Museum of the Royal College of Surgeons, in which the cartilaginous portions had been replaced by a wooden model.—Mr. Tegetmeier exhibited and made remarks on a specimen (in the flesh) of a female of the Great Bustard (*Ovis tarda*), which had been killed on the 29th ult. near Feltham, in Middlesex.—Mr. Gould exhibited and made remarks on a skin of Lady Rosse's Touraca (*Musophaga rossie*), just received in a collection of birds from Loanda.—Mr. Wallace read some extracts from letters received from his brother, Mr. J. Wallace, containing remarks on the habits of a species of Lizard (*Phrynosoma*) and Rattlesnake (*Crotalus*), as observed in California.—A tenth letter was read from Mr. W. H. Hudson, on the ornithology of Buenos Ayres.—A letter was read from Mr. E. P. Ramsay, giving particulars respecting the habits of the new Australian Mud-Fish (*Ceratodus Forsteri*).—The Secretary read extracts from some correspondence between himself and Mr. G. W. des Vœux, Administrator of the Government of Santa Lucia, as to the best method of destroying the Poisonous Serpents (*Craspedocephalus lanceolatus*) found in that island.—Mr. Sclater exhibited and made remarks on the horn of the male Rhinoceros, which that animal had torn off in the Gardens on the 10th August last.—Mr. Flower read some notes on the skeleton of the Australian Cassowary (*Casuarium australe*), in which the differences between the skull of that species and *C. galeatus* were pointed out. Mr. Flower's observations were based on the skeleton of this bird, transmitted to Mr. Sclater by the Messrs. Scott, of the Valley of the Lagoons, Queensland, and now in the Museum of the Royal College of Surgeons.—A communication was read from Mr. Andrew Murray, containing some notes on the structure of the young of the Sterlit (*Acipenser ruthenus*).—A communication was read from Mr. George French Angas, containing descriptions of thirty-four new species of shells from Australia.—A joint communication was read from Dr. G. Hartlaub and Dr. O. Finsch, on two collections of birds from the islands of Savai (Navigator group) and Rarotonga (Hervey group). Several new species were described in this paper, the most remarkable of which was a new form, allied to *Gallinula*, from Savai, proposed to be called *Pareudiastes pacificus*.

Geological Society, December 21. — Mr. Joseph Prestwich, F.R.S., President, in the chair. "On Lower Tertiary Deposits recently exposed at Portsmouth," by C. J. A. Meyer, F.G.S. The author described some exposures of Lower Tertiary deposits made during excavations for the "Dockyard Extension Works" in Portsmouth Harbour. The thickness exposed, exclusive of alluvial deposits, amounted in all to 127 feet. The beds dip S.S.W., or nearly south,  $2\frac{1}{2}$  to 3 degrees. The author grouped them under the following divisions, in ascending order:—

1. Clays and sands with pyrites, 36 feet.
2. Argillaceous sands with *Dentalium*, 25 feet.
3. Sands with *Lingula*, 8 feet.
4. Clays with *Cyprina* and sandy clays, 55 feet.

The author indicated the fossils contained in each of these divisions, remarking upon the range of some of the species, and upon the apparent mixture of London clay forms with others usually regarded as characteristic of higher or lower beds which occurs especially in the "*Lingula* sands." He suggested that, as the species found here present some slight differences from those occurring in other deposits, the difficulty might be got over on Darwinian principles. The author considered that the fossils did not furnish any satisfactory evidence of the true position of these beds; but, from stratigraphical evidence, he regarded them as being included in group 3 and part of group 4 of Mr. Prestwich's section of the Whitecliff strata in the Isle of

Wight. He concluded with some remarks on the superficial deposits consisting of gravel and old and recent mud overlying the Tertiary beds in the section described by him. Prof. Ramsay called attention to the value attaching to such observations as those of the author on the nature of the superficial deposits.—Mr. Etheridge observed that the presence of the *Lingula* determined the position of the Bognor beds in the series, though there appeared great difficulty in fixing it stratigraphically. The commingling of species exhibited in this instance of shells hitherto supposed to be peculiar to certain horizons, he regarded as very remarkable.—Prof. Morris observed that the section seemed to show, not only the order of the beds, but their manner of deposition, the whole having formed part of a tranquil sea-bottom. He remarked on the difficulty of separating the more recent mud deposits from the beds of more ancient date. He pointed out the method of formation of septaria apparently by segregation, as they sometimes included undisturbed parts of the beds. The number of bivalves bored by carnivorous mollusks was remarkable, as was also the absence of *Pectunculus*.—Mr. Gwyn Jeffreys observed on the habits of *Lingula*, which had been by some regarded as an annelid, and not as a mollusk. It afforded a curious instance of the persistence of species, as there was no distinction that could be established between those of the Crag and of Silurian times. It lived at the present time between high and low water mark, and the *Panopæa* at a slightly lower level, and probably had done so in Tertiary times. Mr. Evans inquired whether the upper gravel, like that on the shore of Southampton Water, contained any flint implements. Mr. Meyer replied that he had not examined the gravels with that view.—“Note on some new Crustaceans from the Lower Eocene of Portsmouth, collected by Mr. C. J. A. Meyer, F.G.S.” by Mr. H. Woodward, F.G.S. Mr. Woodward drew attention to the occurrence in the fossil state of pelagic forms of Crustacea armed with long spines on the latero-anterior angles of the carapace. Two Eocene forms had been described by Dr. Alphonse Milne-Edwards, namely, *Enoplonotus armatus* and *Psammodarcinus Hericartii*. Two new forms, differing generically from the above, but probably referable to the same family (the *Portunidae*), were described, under the names of *Rhachisoma* (g. n.), *R. eclinata*, and *R. bispinosa*. A third form, belonging to the *Corystidae*, was then noticed. This family, represented in the fossil state by the genus *Palæocorystes*, is well known in the Gault and Upper Greensand of Folkestone and Cambridge, one species ranging up as high as the Maestricht beds. The occurrence of *Palæocorystes* in the Lower Eocene is of great interest. Mr. Woodward named this new *Palæocorystes*, *P. glabra*. 3. “On the Chalk of the Cliffs from Seaford to Eastbourne, Sussex,” by W. Whitaker, F.G.S.—The author compared the chalk of the Sussex coast with that of the Kentish coast, and stated that it consisted of the following divisions in descending order:—

1. Chalk with flints of great thickness.
2. Chalk with flints and nodular layers, weathering rough.
3. Chalk without flints, but with nodular layers, weathering rough.
4. Thick-bedded massive chalk without flints.
5. More thinly-bedded chalk without flints, but with marly beds.
6. Chalk-marl, 50 or 60 feet.

The highest of these divisions stretches as far eastwards as Beachy Head, and forms the whole of the cliffs to within a short distance of that point. 4. “On the Chalk of the southern part of Dorset and Devon,” by W. Whitaker, F.G.S. The divisions of the chalk were traced by the author westward from cliffs on the north side of Swanage Bay to beyond Beer Head in Devonshire. At first the succession of the beds was shown to be as in the Isle of Wight, namely:—

1. Chalk with flints, very thick.
2. Chalk with few flints.
3. Chalk-rock, very thinly developed.
4. Chalk without flints.
5. Chalk-marl.

It was shown that the lower beds became thinner westward, until, at one part of the Beer Head section, the chalk with flints rested at once on the Upper Greensand; and the following general conclusions were drawn:—That the chalk-marl thins westward, and its bottom part becomes marked by the presence of quartz-grains, showing perhaps signs of a less deep-sea character than usual. That the chalk without flints thins westward (from about 200 feet in the Isle of Wight), until, in Devonshire,

it is but 30 feet thick, or even less. The consequent nearness of the chalk with flints to the Greensand helps to explain the deposits of flints on some of the Devonshire hills. Mr. Etheridge pointed out the resemblance between the series described by the author and that of the chalk of Antrim. He thought it probable that the cretaceous beds had originally extended over the whole of Western England. He called attention to the Blackdown-beds, which had been regarded as Upper Greensand, but certainly were not so, though probably Cretaceous, as well worthy of examination. Mr. Hull hoped that some Fellows of the Geological Society would extend their examination of the chalk into Ireland, and visit the Antrim district. It was the case there that the Chalk with flints rested immediately on the Upper Greensand, though there was an intermediate band known as the Mulatto-bed, which might possibly represent the Chalk-rock. Prof. Morris thought the paper afforded evidence in favour of the Chalk having been deposited in a sinking area, and during the process various alterations in the conditions took place. Mr. D. Forbes inquired as to the character of the nodules mentioned, and whether they were siliceous or not? Mr. Meyer mentioned that near Branscombe there occurred a band within eight feet of the Red Marl, containing fossils apparently the same as those of Blackdown. Mr. Whitaker had purposely avoided characterising the greater part of the Greensand-beds as either Upper or Lower. He thought the Cherty-beds of the west were stratigraphically higher than those of the Isle of Wight. The nodules inquired about were not siliceous, though probably containing some silica, but were rather phosphatic.

Anthropological Society, January 3. Dr. Charnock, V.P., in the chair.—Captain C. C. Poole, of Myansung, Pegu, was elected a Fellow. Professor Cav. Luigi Calvi, of Bologna, was elected a corresponding member.—Mr. Joseph Wilkinson exhibited and described a collection of human remains, weapons, and other works of art, found in an Anglo-Saxon cemetery near Barrington, Cambridgeshire.—Dr. Richard King read a paper on “The Manx of the Isle of Man.” The author treated of the physical and psychological characteristics of the people of the Isle, who, he maintained, were a pure stock of the great “Keltic” division of mankind; of their history, superstitions, language, literature, and works of art, and the statistics of population. On the latter, however, further information was required, which Dr. King hoped the census of 1871 might supply.—A paper by Dr. Beddoe, president, was read “On the Anthropology of Lancashire.” The pre-historic antiquities of Lancashire are rather scanty, and the early and mediæval history of the north-west of England is remarkably barren as compared with that of the north-eastern district. The inhabitants of Salford were of Teutonic character, having been colonised during the Roman period by a cohort of Frisians, a few Danish, and other Scandinavian elements being present. The latter appear to be the strongest. The Saxon, or Angle, is in some force, as is also the Keltic, which, however, seems to have been partly Gaelic, and not wholly Kymric, as might, perhaps, have been expected. The effect of the Norman Conquest on the race elements in Lancashire would probably be inconsiderable, though there, as elsewhere, the Anglo-Danish, or Anglo-Norse, aristocracy, may have been somewhat more diminished, by slaughter and emigration, than the commonalty, whose blood may have had a larger admixture of the Keltic element.

Entomological Society.—Mr. Alfred R. Wallace, President, in the chair. Dr. Ross, of Toronto, was elected a member. The fourth part of the Transactions for 1870, published in December, was on the table. Exhibitions of British *Lepidoptera* were made by Mr. W. C. Boyd and Mr. Verrall; and of West African *Lepidoptera*, by Mr. Butler. A paper by Mr. Hewitson was read, entitled, “New Species of South American Diurnal *Lepidoptera*.”

#### BRISTOL

The Observing Astronomical Society.—Report of observations made by the members during the period from August 6 to October 7, 1870, inclusive. (Continued from page 40.)

*Aurora Borealis*.—Mr. John Birmingham, of Millbrook, Tuam, writes:—“Though the night of the 24th September, when there was no moon and a densely cloudy sky, ought to have been extremely dark, it was, on the contrary, about as bright as if the moon were full, and the sky was similarly overcast. This extraordinary brightness began to decrease at eleven o'clock, and

continued diminishing up till midnight, when the clouds cleared away, and revealed an Aurora Borealis of rare splendour, though it was doubtless inferior to what, unfortunately, the state of the sky prevented from being observed previous to eleven o'clock. The auroral arch was wanting, but long beams extended up from its usual position, and brilliant coruscations were flashing almost on every side to the zenith, even at times from the south. At precisely 0<sup>h</sup> 40<sup>m</sup> G.M.T. there was a well-defined corona, with its centre exactly at *Beta Andromede*. By means of a lamp held at some distance, with the aurora as a background, I was enabled to position three spectroscope lines with a small pocket instrument. These were the usual bright band in the green, a very faint one near it on the left, and one of medium brightness near F. On the night of October 14, during another remarkable display, when the intense red of broad areas of light did not seem enfeebled by the rays of a very bright moon, there was no indication of a red line in the spectroscope. In fact, there was here no line whatever to be detected, and the white light seen in some parts of the sky gave only the one principal line in the green." Mr. H. Michell Whitley, of Truro, reports that on September 21 he observed aurora-parallel streaks of a rosy hue reached to an altitude of about 30° fading away and reappearing in fresh position. On September 24 another aurora was observed by him. "At times the streaks almost reached Polaris. On the following night a repetition of the phenomenon occurred. He observed that the streamers, after fading and disappearing, would again appear in all their beauty in fresh positions, when the sky would glow like a furnace, lighting up the surrounding scenery, as if it were illuminated by the reflection from some distant fire. About 8<sup>h</sup> 15<sup>m</sup> a beautiful rosy beam enveloped Capella, whilst a fiery, glowing cloud lay a little to the east of it. At this time the display was at its maximum degree of splendour." Exhibitions of aurora were also observed by the Rev. S. J. Johnson, of Crediton, Mr. William F. Denning, of Bristol, and other members of the society.

*Occultation of the Planet Saturn.*—Mr. E. B. Knobel writes that this phenomenon was observed exceedingly well at Burton-Trent. "The disappearance occupied 1<sup>m</sup> 10<sup>s</sup>. There was too much twilight for me to pick up Titan. The reappearance was observed to perfection, as far as atmospheric influences went, and, notwithstanding the low altitude, definition was very sharp as the planet emerged behind the bright limb of the moon. Ball's division, the shadow of the planet on the ring, and belt across the planet was quite distinct. The colour or rather the comparison between the colours of the moon and Saturn was decidedly different from that noticed at the April occultation. In consequence of low altitude, Saturn appeared of a light liver colour by the side of the yellow moon, whereas in April the colour of Saturn was more greenish. According to my rough observation, the time during which Saturn was totally occulted was 1<sup>h</sup> 11<sup>m</sup> 35<sup>s</sup>." The Rev. S. J. Johnson, of Crediton, reports that at 4<sup>h</sup> 40<sup>m</sup> he first observed the moon, but could not make out the planet before a quarter to six. "Saturn was then visible though somewhat faint, with a power of seventy on a 2½ in. aperture; with 150 it almost faded away in the field of view. The planet appeared very dull at its emersion." Mr. George J. Walker, of Teignmouth, witnessed the disappearance of the planet with a 2 in. O.G., power 32. The Moon totally obscured Saturn at 5<sup>h</sup> 45<sup>m</sup> 45<sup>s</sup>, town mean time, which equals 5<sup>h</sup> 59<sup>m</sup> 44<sup>s</sup> G.M.T. Mr. J. C. Lambert, of Sleaford, gives the following times of the disappearance of the planet and its ring:—First contact with ring, 6<sup>h</sup> 4<sup>m</sup> 2<sup>s</sup>; first contact with globe, 6<sup>h</sup> 4<sup>m</sup> 14<sup>s</sup>; disappearance of globe, 6<sup>h</sup> 4<sup>m</sup> 50<sup>s</sup>; disappearance of the ring, 6<sup>h</sup> 5<sup>m</sup> 6<sup>s</sup>.

*Jupiter.*—Mr. A. P. Holden, of London, writes: "The chief feature in the belt system of this planet has been the darkness of the permanent belt, which lies midway between the equator and the N. pole. Up till about the end of September it was so dark as to be readily visible with a very low power. Since then it appears to have brightened somewhat." Mr. H. Michell Whitley observed the planet on September 20, 11<sup>h</sup> to 11<sup>h</sup> 30<sup>m</sup>: "The equatorial zone is of the same copper colour as during the last opposition, and of quite as deep a shade. The streaks N. and S. of this zone pale yellow. The narrow sharply-defined belt N. of the N. yellow streak is of a finer tint than in the spring of this year, being of a fine purple grey, with a very perceptible tint of rose colour in it—N. pole, grey. The narrow band S. of S. yellow streak not as fine a colour as the belt N. of N. yellow streak, being purple grey—S. Pole, grey."

*The Nebula in the Pleiades.*—Under very favourable atmospheric circumstances, Mr. Albert P. Holden, of London, has

had a very careful search for this object with his 3 in. refractor of very fine definition. He says: "Although favoured with good eyesight, I entirely failed to pick it up. Upon comparing the image of Merope, as seen in the telescope with that of the *Lucida* of this group, a very perceptible difference was observable. The rings surrounding Merope were more numerous, and had a very misty, ill-defined appearance; they were also markedly extended in a direction N. of the star. With these exceptions not the slightest traces could be found of the nebula. It has been seen with only 2 in. Webb saw it readily on October 6, 1863, but found it 'very feeble' on September 25, 1865. Any member of the society, working with a large aperture, would confer a favour by searching for this object."

*Coggia's Comet.*—This comet has been seen on several occasions by Mr. George J. Walker, of Teignmouth. On the 29th and 30th of September it was in the field with a large number of eight and nine mag. stars. "It looked like a tolerably bright globular nebula."

MANCHESTER

Literary and Philosophical Society, December 27, 1870—E. W. Binney, F.R.S., President, in the chair. "Observation of the Eclipse of the Sun, December 22, 1870," by J. B. Dancer, F.R.A.S. The eclipse of the sun on Thursday, the 22nd of December, was favourably observed at Ardwick. Although a slight fog prevailed, all the details of the phenomenon were distinct, and tolerably well defined. A number of spots were visible on the sun's surface, two of which were of some magnitude. The nuclei of these spots were linked together by maculae, and surrounded by a penumbra which extended to a considerable distance. Faculae also were very numerous and distinct. The approximate times of contact taken by a chronometer corrected by the standard clock at the Town Hall were as follows:—first contact of the moon's limb with the sun 11<sup>h</sup> 5<sup>m</sup> 49<sup>s</sup>; Contact of moon's limb with nucleus of the first large spot, 11<sup>h</sup> 31<sup>m</sup> 36<sup>s</sup>; with the nucleus of the second large spot, 11<sup>h</sup> 37<sup>m</sup> 20<sup>s</sup>; last contact of moon's limb with the sun, Greenwich mean time, 1<sup>h</sup> 37<sup>m</sup> 3<sup>s</sup>. The temperature during the progress of the eclipse was taken at intervals by a mercurial thermometer with a black bulb *in vacuo*, exposed to the sun at the height of 4 feet from the ground.

TIME.			TEMP.
H.	M.	S.	DEGREES.
11	10	0	31.5
—	35	0	30.25
—	45	0	29.75
—	50	0	29.25
12	22	0	27.2
—	35	0	28.5
1	37	0	29.0

I had an impression that the moon's edge could be traced a short distance from the edge of the sun at the upper and lower points of contact, but this might be imagination. The black surface of the moon appeared very uniform in colour. I tried with powers of 80 and 180 to distinguish the moon's disc, but did not succeed. Light clouds were passing over the sun's disc at this time. The diminution in light was quite perceptible at the time of the greatest phase. Mr. Baxendell said that he observed the commencement of the Eclipse at Cheetham Hill. The first contact took place at 11<sup>h</sup> 5<sup>m</sup> 46.2<sup>s</sup> G.M.T. or 24.2 seconds later than the time calculated by Mr. Dickinson and Mr. Hind. The definition of the limbs of the sun and moon, and of the spots on the solar disc, was remarkably good, and he did not think his observation of the time of first contact could be in error to the extent of one second. The limb of the moon on the sun's disc appeared to be more sharply defined than the sun's limb. No distortion of the cusps was noticed. Unfortunately he was obliged to leave the observatory before the end of the eclipse, and therefore did not observe the time of last contact.

EDINBURGH

Royal Society, December 19.—Dr. Christison, the President, in the chair. The following papers were read:—1. Additional Remarks on the Theory of Capillary Attraction, by E. Sang, Esq., C.E. 2. Laboratory Notes: On Thermo-Electricity, by Prof. Tait. An endeavour to prove, experimentally, that the electric connection of heat is proportional to the absolute temperature, and an application of this result to the

measurement of high temperatures. (3 and 4.) Note on Linear Differential Equations in Quaternions, and Note on some Quaternio Integrals, by Prof. Tait. (5.) Note on an Ice Calorimeter, by Prof. Crum Brown. The author had, some years back, ordered the construction of an instrument on the same principle as that lately described by Bunsen. It is not yet completed, and he sent this note, not of course to claim priority, but to reserve to himself the right to use his own instrument.

Royal Physical Society, December 21.—Mr. R. F. Logan in the chair. The office-bearers for the session were elected as follows:—Presidents: R. F. Logan, C. W. Peach, Dr. Robert Brown. Council: James M'Bain, M.D., R.N.; Stevenson Macadam, Ph.D.; Andrew Wilson, Robert Scot Skirving, David Grieve, Professor Duns. Secretary: John Alexander Smith, M.D. Treasurer: Henry Budge, C.A. Assistant Secretary: James Boyd Davies. Honorary Librarian: Andrew Taylor. The Secretary exhibited the head of a roedeer, with the upper part of each horn bent backwards into a hook shape, or rather a complete loop; probably due to an injury when the horns were growing. He also exhibited a curious large specimen of a pigeon, with a bluish-grey head, mottled with white, and rest of plumage nearly white, the back and wings mottled with a few darker feathers; tail large, nearly white; the breast and abdomen show traces of the reddish colour of the cushat, and the sides of the neck also showed the bright white spot, slightly bordered with green and red reflections, as in the cushat. It was shot in company with a flock of wood pigeons at Aldrught, near Elgin, in December, 1869. The bird has been supposed to be probably a hybrid between the cushat, or wood pigeon, and a fancy domestic pigeon, as a pouter, being rather larger in size than the cushat. If this were so, it is perhaps the first instance of the kind that has been observed; but probably a much more simple explanation may be given by considering it simply an albino cushat, or variety showing the plumage much changed to white. Very little variety occurs in the plumage of the cushat, so that the specimen is a rare one. The secretary also exhibited a specimen of the *Labrus mixtus*, or cuckoo wrass, taken on a long or hadock line in the Firth of Forth, in September, 1870. It is common on some rocky coasts, and specimens have been taken according to Mr. C. W. Peach, at Wick, Iverach, and Kirkwa, in Orkney, but has apparently not before been recorded as taken in the Firth. The *Labrus trimaculatus*, or three-spotted wrass has, however, been taken once or twice in the Firth of Forth; and, according to Dr. Günth, in his valuable "Catalogue of Fishes," the latter is not a distinct species, but simply the female of the *Labrus mixtus*.—Mr. Robert Brown, Ph. D., M.A., submitted some recent observations regarding the Arctic marine currents. The author considered that there, were three main currents, which traversed the Arctic, American and European seas, exclusive of those of Asia and Behring Straits. These were:—1. The current sweeping out of the Kara Sea to the westward, getting deflected against the Greenland coast; sweeping down that coast at the average rate of eight knots an hour, varying according to the season, doubles Cape Farewell, and then runs north along the western shores of Greenland, decreasing in rapidity and in breadth from about 100 miles, to which it stretches at Cape Farewell, until its force is exhausted at near Disco Island. This current jams up the eastern shores of Greenland, within which it is always on the move summer and winter, and as seen rounding Cape Farewell is known to Davis Strait navigators as the "Cape Ice." It brings into Davis Straits great quantities of driftwood and Polar bears. 2. A current down Davis Strait. About Riskol it is deflected off to the westward, and flows down the western shores of Davis Strait, carrying down great quantities of icebergs, which strand and melt on the banks of Newfoundland, there depositing their loads, others helping to form these banks. Here it meets with the Gulf Stream—the meeting of the cold and warm currents giving rise to the fogs so characteristic of that locality. At the mouth of Davis Strait there is an indraught of the Gulf Stream, which joins the Cape ice on the Greenland coast. It is also to this indraught that the drift mahogany logs, now and then picked up on the Greenland coast, are due. 3. The Gulf Stream, with the exception of the indraught already mentioned, does not enter Davis Strait, but sweeps across the Atlantic, retaining some degree of warmth as far as Novai Zemlai, and landing tropical products on the shores of Iceland and Spitzbergen. It is to this current that is due the freedom of the harbours of Norway and South-Western Iceland from ice.

BOOKS RECEIVED

ENGLISH.—The Heavens; A. Guillemin, 4th edition, edited by J. N. Lockyer (Bentley).—Travels in the Air: Jas. Glaisher, C. Flammarion, W. de Foville, and G. Tissandier (Bentley).—A Treatise on Magnetism: G. B. Airy (Macmillan).—The Student's Elements of Geology: Sir C. Lyell (Murray).—The Marvels of the Heavens: C. Flammarion, translated by Mrs. Lockyer (Bentley).—Elementary Natural Philosophy: J. Clifton Ward (Trübner).—The Duke of Edinburgh in Ceylon (Provost and Co.).  
FOREIGN.—Jahrbuch der k. k. geologischen Reichsanstalt zu Wien, 1870. (Through Williams and Norgate).—Die Mineralien: J. C. Weber.—Die Fische Deutschlands und der Schweiz: J. C. Weber.

DIARY

THURSDAY, JANUARY 12.

ROYAL, at 8.30.—On Fluoride of Silver, Part II.: G. Gore, F.R.S.—Polarisation of Metallic Surfaces in Aqueous Solutions: Some Experiments on the Discharge of Electricity through Rarefied Media: C. F. Varley.  
SOCIETY OF ANTIQUARIES, at 8.30.—Election of Fellows.  
LONDON MATHEMATICAL SOCIETY, at 8.—On Systems of Tangents to Plane Cubic and Quartic Curves: J. J. Walker.—On the Order and Singularities of the Parallel of an Algebraical Curve: S. Roberts.

FRIDAY, JANUARY 13.

ROYAL ASTRONOMICAL SOCIETY, at 8.  
QUEKETT MICROSCOPICAL SOCIETY, at 8.

TUESDAY, JANUARY 17.

ZOOLOGICAL SOCIETY, at 9.—On a Skull of a Narwhal with two tusks, in the Cambridge University Museum: John W. Clark.—Descriptions of some new species of Australian Land Shells: Dr. James C. Cox.—Notes on some points in the Osteology of *Rhea Americana* and *Rhea Darwinii*: Dr. R. O. Cunningham.  
ROYAL INSTITUTION, at 3.—Nutrition of Animals: Dr. M. Foster.  
STATISTICAL SOCIETY, at 7.45.—On the Comparative Taxation on Real Property, Personality, and Income: R. Dudley Baxter, M.A.  
ANTHROPOLOGICAL SOCIETY, at 4.—Annual Meeting.

WEDNESDAY, JANUARY 18.

METEOROLOGICAL SOCIETY, at 7.—Heights and Velocities of August Meteors in 1870: Prof. A. S. Herschel.—Lunar Influence upon Rainfall: John C. Bloxam.—On Prof. Poey's new Classification of Clouds: Dr. R. J. Mann.  
SOCIETY OF ARTS, at 8.  
ROYAL SOCIETY OF LITERATURE, at 8.30.—On Prospero's Clothes-line (by A. E. Brae): Dr. C. M. Ingleby.

THURSDAY, JANUARY 19.

ROYAL SOCIETY, at 8.30.  
SOCIETY OF ANTIQUARIES, at 8.30.  
LINNEAN SOCIETY, at 8.—On the Vegetation of the Solomon Islands: Mr. Atkin.—Note on *Byrsanthus (Homalinee)*: Dr. M. T. Masters, F.R.S., F.L.S.—Historical Notes on the *Radix Galanga* of Pharmacy: Daniel Hanbury, F.R.S., F.L.S.  
CHEMICAL SOCIETY, at 8.  
ROYAL INSTITUTION, at 3.—Davy's Discoveries: Dr. Odling.

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ERRATUM.—Page 182, first column, line 34, for "we are justified," read "we are not justified."